

August 1, 1995

DOCKET FILE COPY ORIGINAL

RECEIVED

AUG 1 1995

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

EX PARTE

William F. Caton
Acting Secretary
Federal Communications Commission
Mail Stop 1170
1919 M Street, N.W., Room 222
Washington, D.C. 20554

EX PARTE OR LATE FILED

Dear Mr. Caton:

Re: *CC Docket No. 94-54 - Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services*

On behalf of Pacific Bell Mobile Services, please find attached a copy of an Affidavit of Jerry A. Hausman previously submitted to the Commission Gen. Docket No. 90-314 along with a report prepared by Dr. Hausman on May 15, 1993. Please associate this material with the above-referenced proceeding.

We are submitting two copies of this notice in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me should you have any questions or require additional information concerning this matter.

Sincerely,



Attachments

cc: Michael Wack
Pamela Menga

No. of Copies rec'd
List A B C D E

041

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Amendment of the Commission's
Rules to Establish New Personal
Communications Services

) GEN Docket No. 90-314
) ET Docket No. 92-100
)

) RM-7140, RM-7175, RM-7617,
) RM-7618, RM-7760, RM-7782,
) RM-7860, RM-7977, RM-7978,
) RM-7979, RM-7980
)

) PP-35 through PP-40, PP-79
) through PP-85
)

AFFIDAVIT OF JERRY A. HAUSMAN

JERRY A HAUSMAN, being duly sworn, deposes and says:

1. My name is Jerry A. Hausman. I am MacDonald Professor of Economics at the Massachusetts Institute of Technology in Cambridge, Massachusetts, 02139.

2. I received an A.B. degree from Brown University and a B.Phil. and D. Phil. (Ph.D.) in Economics from Oxford University where I was a Marshall Scholar. My academic and research specialties are econometrics, the use of statistical models and techniques on economic data, and microeconomics, the study of consumer behavior and the behavior of firms. I teach a course in "Competition in Telecommunications" to graduate students in economics and business at MIT each year. Mobile telecommunications is one of the primary topics covered in the course. I was a member of the editorial board of the Rand (formerly the Bell) Journal of Economics for the past 13 years. The Rand Journal is the leading economics journal of applied microeconomics and regulation. In December 1985, I received the John Bates Clark Award of the American Economic Association for the most "significant contributions to economics" by an economist under forty years of age. I have received numerous other academic and economic society awards.

3. I have done significant amounts of research in the telecommunications industry. My first experience in this area was in 1969 when I studied the Alaskan telephone system for the Army Corps of Engineers. Since that time, I have studied the demand for local measured service, the demand for intrastate toll service, consumer demands for new types of telecommunications technologies, marginal costs of local service, costs and benefits of different types of local services, including the effect of higher access fees on consumer welfare, demand and prices in the cellular telephone industry, and consumer demands for new types of pricing options for long distance service. I have also studied the effect of new entry on competition in paging markets, telecommunications equipment markets, and interexchange markets and have published a number of papers in academic journals about telecommunications. I have also edited a recent book, Future Competition in Telecommunications (Harvard Business School Press, 1989). Lastly, I have edited a forthcoming book, International Competition in Telecommunications (Harvard Business School Press, 1993).

4. I have provided testimony regarding cellular telephone previously to both federal and state regulators. I submitted affidavits to the FCC with respect to competition in the cellular industry in 1988 and 1989. I have participated in investigations and regulatory hearings in California that involved paging and cellular telephone in 1985-86 (both), 1988 (paging), 1989 (cellular), and 1991 (cellular). I have also testified before other state regulatory commissions regarding the proper scope of regulation of cellular telephone service. In 1989 I submitted testimony to the U.K. government (Department of Trade and Industry) regarding likely future developments of proposed Personal Communications Networks (PCNs). Beginning in 1989 and up to the present, I have continued to analyze the possible future evolution of PCNs and their likely competitive effect on cellular, local exchange, interexchange, and other telecommunications services.

5. I have significant antitrust experience. I have participated in merger analysis before the Department of Justice in a number of industries including long distance, paging, and cellular. I have also submitted affidavits to Judge Greene on antitrust issues which arise with the MFJ. I have published research papers on antitrust issues and have given invited lectures to both the Department of Justice and the American Bar Association on antitrust topics, including antitrust issues which arise in telecommunications.

6. I have been asked by Pacific Telesis Group (Telesis) to analyze the factors involved in the question of whether LEC, e.g. Pacific Bell and Nevada Bell, participation should be permitted by the FCC in Personal Communications Services (PCS). I have therefore focussed on paragraphs 71-80 of the NPRM of July 16, 1992. In my analysis I have also considered the overall NPRM, various submissions and pioneer preference filings, and industry conditions for telecommunications services.

I. SUMMARY AND CONCLUSIONS

7. Considerable competition will exist in two-way mobile telecommunications, with cellular providers, EMSR (Fleet Call), and PCS providers all able to provide competitive services.

8. Significant demand exists for a mass-market PCS service. LEC participation in PCS will lead to a low price mass-market PCS service. LECs have a low-cost platform, the advanced intelligent network, which creates economies of scope which will lead to a lower cost basis for PCS which in turn will lead to lower prices. LECs also have economies of scope through their mass market distribution system which will lead to lower cost and lower priced services. This outcome for PCS has already been observed with BOC provision

of voice messaging services.

9. Regulatory safeguards will ensure that LECs will not discriminate against their PCS competitors or cross-subsidize PCS with their wireline services. The FCC has a well-developed regulatory framework which can be applied to PCS.

10. LECs should be permitted to participate in a lottery or to purchase PCS licenses. A restriction on LECs to 10 MHz of PCS spectrum is likely to lead to economically inefficient outcomes. The market mechanism should be used to determine the most efficient use of PCS spectrum.

11. LEC participation will not lead to a decrease in competition. To the contrary, given their economies of scope, LECs will be able to provide a low price mass-market PCS service which will benefit consumers. LEC participation in PCS will be a pro-competitive outcome.

II. ECONOMIC FOUNDATION OF PCS ANALYSIS

12. Two current conditions in the cellular industry underlie the analysis that I have done: (1) two cellular operators compete in almost all areas of the U.S. and (2) additional competition to cellular will begin next year by Enhanced SMR. Currently, each MSA and almost all RSAs have two operational cellular carriers. The growth of cellular has been extremely rapid with average growth over the past 3 years averaging about 30%-40% per year. An extremely important factor in this fast growth rate has been the decrease in cellular equipment prices to consumers which has resulted from a combination of lower manufacturers' prices and competition among cellular carriers for new customer signups. The carriers have competed in many geographic areas by paying agents \$300-450 for each new customer; the agents

in turn can then offer equipment at lower prices, to attract new customers. My previous research has confirmed that "entry" costs for consumers are an important factor in adoption of new technologies by consumers and in the choice of using telephone service, e.g. J. Hausman, "Individual Discount Rates and the Purchase and Utilization of Energy Using Durables", Bell Journal of Economics, 1979 and "The Effects of the Breakup of AT&T on Telephone Penetration in the U.S., forthcoming American Economic Review, 1993. Thus, the availability of inexpensive subscriber equipment (and service) is likely to be an important factor in the potential development of a "mass-market" PCS service.

13. Additional competition to cellular service is expected soon. On February 13, 1991 the FCC granted Fleet Call's request to allow it to use its Specialized Mobile Radio (SMR) spectrum to offer digital Enhanced SMR (ESMR) in six cities, including New York, Los Angeles, and San Francisco. Fleet Call's press releases and public offer documents state that it expects to offer service in California, San Francisco and Los Angeles, beginning in 1993. Comcast, a company with interests in both cellular telephone and cable TV, recently invested \$50 million in Fleet Call and agreed to make an additional \$50 million investment in the future (Telecommunications Reports, Sept. 21, 1992). SMR was previously limited to a dispatch service; ESMR will provide service similar to cellular but will use the latest digital technology. The FCC has preempted state regulation to give the maximum competitive flexibility to ESMR providers. The president of Fleet Call stated that he expected the ESMR system to be useable both in vehicles and as portable equipment with features similar to PCNs (Telecommunications Reports, February 18, 1991, p. 7). Fleet Call has also completed an agreement with Motorola, Northern Telecom, and Matsushita for debt financing and equity investments of an additional \$350 million. Thus, I expect Fleet Call to begin operation in New York, Los Angeles, and San Francisco, and to expand to other cities in the next few years. Furthermore, I expect Fleet Call or another operator to

purchase sufficient SMR spectrum in other cities to provide service, to the extent that sufficient demand exists for another mobile service. The transfer or sale of SMR licenses can take place with minimum regulatory review so that economic reasoning leads to the conclusion that they will be used in their greatest value mode of operation.

14. For the remainder of my analysis I will assume that the FCC will offer a minimum of three PCS licenses in each geographic area which is chosen for the award of licenses. This assumption follows the NPRM (para. 61). Thus, I expect that a minimum of 6 mobile operators (2 cellular, 1 ESMR, and 3 PCS) will have the potential to operate in each area. Depending on the position of the demand curve in each area, all 6 licenses may not be used. However, the important economic factor is that 6 licenses will be available.

15. Research that I undertook in 1990-91 and more recent research undertaken by Pacific Telesis has demonstrated that significant demand exists for PCS. My research demonstrated that a potentially large segment of consumers, mainly residential customers, would buy PCS, but that the segment was quite price sensitive. When I combined the PCS research with research on cellular demand, I concluded that residential demand was very price elastic and that residential customers and usage would be significantly increased with lower prices. This segment was willing to trade off either full mobility or ubiquitous coverage for a lower price. My findings seem consistent with the large consumer demand for portable telephones, given sales of about 10 million in 1990 in the U.S. with either free or low cost usage. (Table 1-23 EIA 1990 ed. Markets Data Book) Thus, a low price mass-market segment seems likely to be available to PCS to the extent that service and equipment prices are not too high.

III. LEC PARTICIPATION IN PCS WILL BE PRO-COMPETITIVE

16. LECs will have potentially important economies of scope in two areas: technology and distribution. I expect PCS to have elements of both complementarity and substitution for landline telephone service. Since LECs are engaged in the construction of the advanced intelligent network (AIN) with features such as common channel signalling which are likely to have an important role in PCS, the PSTN can provide a low cost platform on which to base certain versions of PCS. New investments to provide certain features of PCS will not have to be made since the features will already exist in the PSTN. Since these investments will be used in both landline service and PCS, economies of scope will arise which will lead to lower costs and prices for both landline service and PCS. Given the FCC's historic interest in promoting universal service for landline customers and in the efficient use of investments in the PSTN, these economies of scope should be utilized.

17. The advanced intelligent network of the PSTN and its potential role as a low cost platform for PCS will be available for use both by LECs and by other providers of PCS. LECs will provide the use of the PSTN as a "wholesale service" to other PCS providers, and LECs should also be permitted to provide "retail" PCS services to consumers. The FCC has well-developed safeguards, which I discuss below, which can ensure non-discriminatory use of the PSTN by PCS competitors to the LECs. Other safeguards also exist for the potential problem of cross-subsidy from LEC local exchange services to LEC PCS services. LEC participation as a provider of both wholesale and retail PCS will create the correct economic incentives for the optimal development of the intelligent network and use of the PSTN for both PCS and wireline services.

18. I expect that network intelligence will play a crucial role in the evolution of PCS. Network intelligence is the key to integrating systems in a way that makes it as convenient to receive calls as it is to make them, and to

provide customers with control over their accessibility. From my general knowledge of the cellular industry, I estimate that only about 10-20% of cellular calls are non-originated cellular calls because of the inability or inconvenience to control incoming calls and the requirement that all received calls are billed to the cellular subscriber. Thus, cellular has supplied excellent mobility for outgoing calls, but cellular has not yet been that successful in providing for "wireless tails". For PCS to meet the goal of wireless tails, network intelligence will play an important role. With LEC participation in PCS, I expect that use of PSTN network intelligence will help to reach the goal of wireless tails for both PCS and cellular in the future. Network intelligence will also be a component of every licensee's cost structure and may have a significant effect on the price of PCS.

19. The LECs, including Pacific Bell and Nevada Bell, will offer access to their network intelligence to all competitors on the same terms and conditions. Other providers of advanced intelligent networks, including cable networks, IXC networks, and CAP networks, will provide competitive network services to the LECs. However, I expect that, because of Pacific Bell's economies of scale, network experience, and economies of scope, Pacific Bell will be able to provide extremely cost effective intelligent network capabilities. Since Pacific Bell's strategic market objectives for PCS include the ability to serve its mass market with an affordable wireless service, Pacific Bell will make optimal use of its intelligent network infrastructure. This economic outcome will be extremely favorable for both consumers and for PCS competitors who will access to the same PSTN intelligent network features that Pacific will use at the same price. The FCC has regulations in place, which I discuss below, that will prevent cross-subsidies and discrimination by Pacific Bell against its PCS competition. The more the PSTN infrastructure is utilized by PCS, the more both future PCS customers and also wireline customers will benefit because of the economies of scope which will allow the intelligent network enhancements to be used in the provision of

both types of services.

20. Given my view of PCS being both a complement and substitute for wireline, the future evolution of the PSTN will likely have a crucial role in the features and costs for PCS. Regulatory requirements to allow non-LEC PCS providers to use the PSTN while excluding LEC provision of PCS over the PSTN, in principle, offer another framework in which the LECs' PSTN would be utilized in PCS, but this approach is far inferior to the use of market incentives for LEC participation. That is, LECs could be precluded from offering their own "retail" PCS service, but they would be expected to provide part of the network backbone and intelligence for the operation of other carriers' PCS networks. However, such a framework is unlikely to provide sufficient incentives for the LECs to design their future networks in a way to allow for low cost provision of both PCS and landline services. Market incentives with LEC participation in offering PCS services, along with regulatory safeguards, will yield the best method of having the PSTN evolve to serve both landline requirements and PCS requirements. Economic experience has demonstrated that market incentives, while not perfect, almost always are superior to government command and control methods for the future evolution of a given industry.

21. Besides a low-cost technological base, the LECs also have an extremely efficient distribution system for mass-market telecommunications services. For instance, consumer acceptance of information services has been very slow in the U.S. compared to the experience in France, c.f. J. Hausman, "Competition in the Information Market 1990" (August, 1990). However, in 1988 Judge Harold Greene removed the transmission restriction for information services for the BOCs with a complete removal of the information services restriction in 1991. In a relatively short time period the BOCs have introduced mass market voice messaging systems. Pacific Bell currently has 450,000 customers for its voice messaging service in California, despite

lingering MFJ restrictions which continue to hinder the offering of a full-featured service. This very successful launch of voice messaging services far surpasses other largely unsuccessful attempts to offer mass-market information services. Again the economies of scope inherent in the LECs mass-market distribution system should lead to lower cost, and thus lower price, PCS offerings.

22. The experience in BOC information service provision has been consistent with FCC statements to Judge Greene. While opponents to BOC participation in information services emphasized the possibility of BOC discrimination or cross subsidy with an increase in the rates for regulated monopoly services providing funds for unregulated services, the FCC favored BOC participation because "American consumers should have maximum possible access to the benefits of advanced computer and communications technology". (Memorandum of FCC, August 22, 1990, p. 7) The FCC also stated that "the restriction on BOC information services needlessly reduces the incentive the BOCs otherwise would have to add new functionalities to the public switched network". (ibid., p. 8) The FCC emphasized that effective regulatory safeguards existed to address any concerns that might arise with respect to discriminatory access and improper cross-subsidization by the BOCs. (ibid., p. 11)

23. Particular regulations which the FCC discussed in its filing included comparably efficient interconnection (CEI) and ONA safeguards which require "equal access" interconnections to the BOCs' basic network at the same rates that the BOC must pay. The FCC also emphasized the accounting safeguards it has in place, in particular the Joint Cost rules, which discourages improper cost shifting and allows regulated service ratepayers to share in the economies of scope which arise through joint use of the PSTN. Lastly, the Commission discussed the use of the Automated Reporting and Management Information System (ARMIS) which allows benchmark comparison among

the BOCs given the standardized form of the reporting system. The FCC was confident that its regulations would safeguard competitors to the BOCs from potential problems of discrimination or cross-subsidization. These same regulatory safeguards can be applied to LEC provision of PCS services.

24. I expect that some potential PCS entrants will attempt to preclude LEC participation in retail PCS by saying that LECs will have an "unfair" advantage. The essence of competition is that each firm attempts to use its advantages to offer a better product or service at a lower price to consumers. The LECs have advantages which should be used to provide a potentially low price mass market PCS. Just as cable operators or IXCs and CAPS should be permitted to use their networks in the best possible way to provide PCS, LECs should have the same ability to offer the best possible PCS. "Asymmetric regulation", since it tends to protect certain providers and to create price umbrellas, will lead to a decrease in consumer welfare in the name of protecting competition. Consumers are made best off when each competitor can offer the best service it can provide at the lowest price.

IV. LECs SHOULD BE PERMITTED TO PARTICIPATE IN A LOTTERY OR TO PURCHASE PCS LICENSES

25. LECs should be permitted to participate in an FCC lottery, and even more importantly, should be permitted to purchase PCS licenses without restrictions. I do not believe that the 10 MHz option discussed in paragraphs 77-78 of the NPRM would lead to an economically efficient outcome. Economic efficiency requires that producers who can provide the product which consumers value most should be able to buy the necessary factor inputs to produce the product or service. To the extent that LECs have economies of scope in technology and distribution which permit them to offer a lower price service which satisfies consumer demand, an artificial restriction to 10 MHz will lead to undesirable market outcomes which will lower consumer welfare.

26. If the LECs are only allowed 10 MHz of spectrum, then a LEC will either be required to offer a lower quality service, which uses less spectrum than optimal, or it will have to ration demand or charge a higher price to limit demand. All of these outcomes are undesirable from the consumer welfare viewpoint. The NPRM states that 10 MHz "may be sufficient for the initial deployment of a PCS system integrated with a wireline local operating company." However, no support is given for this statement, and Telesis studies show that 10 MHz is not sufficient to provide a mass market PCS service. Unresolvable uncertainty must exist about the "correct" amount of spectrum for a LEC-provided PCS service. Economic markets are designed to resolve this uncertainty about spectrum requirements in an optimal manner. By requiring market participants to "put their money on the table", both the seller of the license and the buyer will make their best attempt to determine the best service they can provide. If a LEC believes it can provide a PCS which will generate sufficient consumer demand at a price which creates a profit sufficient to fund the investment, it will be willing to pay for a PCS license of the typical block size. If the LEC is restricted from buying the license, the license will go to an alternative provider who will offer a service which will provide less value to society. Economic efficiency will decrease as the result of the artificial restriction.

27. The possible division of the spectrum into different size blocks may make economic sense. Thus, the discussion in paragraph 28 of the NPRM of offering one smaller block of 10 MHz (with the other blocks being perhaps 25 MHz) offers buyers an option of what block size they prefer to buy. A potential PCS service provider may decide to offer a service which requires less spectrum. However, no buyer should be restricted to the more narrow block. If technology permits, I believe that a likely more efficient outcome would result if, for example, 3 25 MHz blocks were used, with the buyer of a given block allowed to subdivide the block of spectrum. Thus, a potential PCS service provider could buy or lease 10 MHz of spectrum if the provider found

that amount of spectrum to best fit the needs of the new PCS service.

28. It would be extremely poor economic policy to forbid a competitor, here the LECs, from using an efficient technology or from offering a particular service. Technological changes in telecommunications over the past two decades including the widespread use of microwave, digital switching, and fiber optic transmission have all led to profound competitive changes in telecommunications. PCS is likely to create a similar significant change in technology and competition. Given the historic role of the LECs in the provision of universal service and the national investment in the PSTN, both future technological development and future competition will be perversely affected by regulation which does not allow the LECs to compete. While some individuals state that it is "unfair" for the LECs to compete for PCS spectrum since (in many cases) LECs were given cellular spectrum, this argument does not make economic sense. The LECs will be required to buy (in the secondary market) their PCS spectrum, and the cost of the spectrum will be a fixed cost for a LEC or any other PCS competitor. Economic efficiency requires that scarce spectrum be used to produce the highest value service which LEC participation will help to guarantee, if they are permitted to participate.

29. Requiring LECs to use cellular capacity (that LEC affiliates typically hold in partnership with other firms), with a restriction that LECs not be allowed to purchase PCS spectrum also will lead to economic inefficient outcomes. The cellular network is an overlay network designed to be largely separate from the landline network, in part because of regulatory constraints. Much of the investment in a cellular network is a sunk cost--the investment would not be recovered if an alternative network configuration were adopted. Thus, the amount of integration of cellular networks with the landline network is likely to remain limited in the future, even if regulatory restrictions which currently prohibit such integration were removed. However, the economically efficient outcome of the "correct" amount of integration is again

a decision that markets are best equipped to decide. To the extent that the economically efficient outcome is not to integrate cellular with landline to provide a PCS service, a LEC will find it best to purchase PCS spectrum. If the sunk costs turn out not to be significant and transaction costs with its cellular partners are not too high, a LEC may find it best to integrate its cellular network and landline network and not purchase PCS spectrum. My understanding is that cellular network integration is not currently seen as an economically attractive option by Telesis, but again I believe that a market outcome is the best means to decide the issue.

V. LEC PARTICIPATION WILL NOT LEAD TO A DECREASE IN COMPETITION OR OTHER ANTITRUST PROBLEMS

30. My recommendation that the FCC permit LEC participation in PCS with no limitation on spectrum purchases through economic markets is subject to a potential criticism. The potential criticism is that LECs may have an incentive to purchase PCS spectrum to limit competition to their cellular affiliates or to their wireline operations in the future. I analyze LEC participation below using the approach of the Department of Justice and Federal Trade Commission Horizontal Merger Guidelines (April 2, 1992, "Merger Guidelines"). I find it extremely unlikely that LEC participation in PCS will lead to the exercise of market power by either LEC cellular affiliates or by LEC wireline operations.

31. For the use of my analysis I will use a product market definition of two-way mobile telecommunications which includes cellular, ESMR, and PCS. The geographic market I will use will be the serving area of the mobile provider, e.g. an MSA for current cellular service. Part I of the Merger Guidelines proceeds to calculate market shares and a concentration measure, the HHI. However, given the uncertainty about the future types of PCS services and relevant capacities, I will instead do a Part II Merger

Guidelines "Competitive Effects" type of analysis, since the Merger Guidelines state that "...market share and concentration data provide only the starting point for analyzing the competitive impact of a merger". (para. 2.0)

32. For example, I will assume that LEC purchase of a PCS license will reduce the number of potential mobile competitors in a given geographic market from 6 to 5 competitors (2 cellular, 1 ESMR, and 3 PCS). In a given geographic market, if all 3 PCS licenses are not purchased, no anti-competitive effect can occur because no entry problems exist (c.f. Part III of the Merger Guidelines on Entry Analysis). LEC participation in PCS will then have a pro-competitive effect. Thus, only in areas where all 3 PCS licenses are purchased is a competitive analysis required.

33. The Merger Guidelines identifies two ways in which competition may decrease via a merger or acquisition. One type of problem, lessening of competition through unilateral effects (para. 2.2), in which a single firm withholds output to cause price to rise, cannot plausibly happen with PCS. The Guidelines point out that output restriction cannot occur if a large number of customers can find economical alternative sources of supply. Since the other PCS providers will not face capacity restrictions and cellular capacity restrictions will decrease markedly with the adoption of either TDMA or CDMA, a unilateral restriction of output will be unable to succeed.

34. The other way in which competition may decrease following a merger is when firms engage in coordinated interactions that leads to higher prices. (Merger Guidelines, para. 2.1) However, coordinated interaction seems very unlikely in a mobile telecommunications market with 2 cellular providers, an ESMR provider, and at least 2 PCS providers (I am assuming that one PCS license has been acquired by a LEC which is affiliated with a cellular provider in the same geographic market). A number of economic factors discussed by the Merger Guidelines makes such coordinated interaction very

unlikely. Among these factors are:

(1) Firm heterogeneity: a LEC has very different incentives than do cellular companies or non-LEC PCS companies. For instance, the degree of vertical integration for a LEC is very different than for its cellular competitors. LECs also derive revenues, such as access or interconnection, from greater use of cellular which decrease their incentive to agree to higher prices which would decrease demand. Thus, agreement among the mobile service providers would be difficult to reach.

(2) Product heterogeneity: PCS and cellular may have quite different product characteristics. Again it becomes very difficult to agree on terms for a cartel.

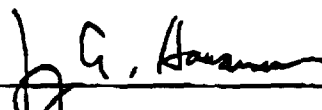
(3) Detection of cheating is difficult: churn is high in cellular (and other mobile services such as paging) so customers losses due to cheating may be difficult to determine.

(4) Incentives to cheat: given the relatively high fixed costs and low incremental cost of serving an additional customer, the incentive to cheat on a cartel become quite high since cheating is very profitable.

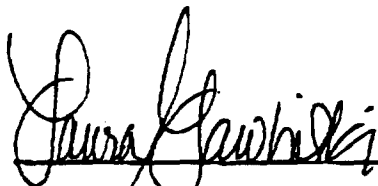
(5) Regulation: both the FCC and state regulators have the ability to collect data from firms to investigate possible problems. Furthermore, many market areas will exist which can provide benchmarks that a given area has prices too high to be explained by competition.

(6) History of the industry: future industry participants, such as the cable companies and CAPs, have fought with the LECs over numerous issues over the years. An agreement would seem extremely unlikely in this type of situation where numerous "maverick firms" (Merger Guidelines, para. 2.12) will exist and will continue to compete with LECs for other services. Thus coordinated interaction in the provision of mobile services is unlikely to occur.

35. The other relevant section of the Merger Guidelines is Part IV on Efficiencies. The Merger Guidelines recognize economies of scale, economies of scope, and distribution efficiencies (para. 4.) all of which the LECs will bring to PCS service provision. Thus, the Merger Guidelines discussion of the pro-competitive effects of mergers which result in lower prices to consumers (para. 4.) can be applied directly to LEC participation in PCS. Other competitive networks exist for the provision of PCS including cable networks, IXC networks, and CAP networks, but use of the LEC PSTN and LEC distribution efficiencies may well lead to low price mass market provision of PCS. The LECs should be encouraged to develop their network intelligence capability to the maximum extent possible in the provision of PCS. LEC participation in the provision of PCS will create the maximum incentives for this outcome to occur with benefits to consumers from lower priced PCS and wireline service.


 JERRY A. HAUSMAN

Subscribed and sworn to before me
 this 4th day of November, 1992


 Notary Public

My Commission Expires July 3, 1998

Analysis by Professor Jerry A. Hausman of the paper
"Wireless Access to the Local Loop"
by Terence P. McGarty, the Telmarc Group, Inc.

Jerry A. Hausman
MacDonald Professor of Economics, MIT
May 15, 1993

REPORT OF JERRY A. HAUSMAN

1. My name is Jerry A. Hausman. I am MacDonald Professor of Economics at the Massachusetts Institute of Technology in Cambridge, Massachusetts, 02139.

2. I received an A.B. degree from Brown University and a B.Phil. and D. Phil. (Ph.D.) in Economics from Oxford University where I was a Marshall Scholar. My academic and research specialties are econometrics, the use of statistical models and techniques on economic data, and microeconomics, the study of consumer behavior and the behavior of firms. I teach a course in "Competition in Telecommunications" to graduate students in economics and business at MIT each year. Mobile telecommunications is one of the primary topics covered in the course. I was a member of the editorial board of the Rand (formerly the Bell) Journal of Economics for the past 13 years. The Rand Journal is the leading economics journal of applied microeconomics and regulation. In December 1985, I received the John Bates Clark Award of the American Economic Association for the most "significant contributions to economics" by an economist under forty years of age. I have received numerous other academic and economic society awards.

3. I have done significant amounts of research in the telecommunications industry. My first experience in this area was in 1969 when I studied the Alaskan telephone system for the Army Corps of Engineers. Since that time, I have studied the demand for local measured service, the demand for intrastate toll service, consumer demands for new types of telecommunications technologies, marginal costs of local service, costs and benefits of different types of local services, including the effect of higher access fees on consumer welfare, demand and prices in the cellular telephone industry, and consumer demands for new types of pricing options for long

distance service. I have also studied the effect of new entry on competition in paging markets, telecommunications equipment markets, and interexchange markets and have published a number of papers in academic journals about telecommunications. I have also edited two recent books, Future Competition in Telecommunications (Harvard Business School Press, 1989) and Globalization, Technology and Competition (Harvard Business School Press, 1993).

4. I have provided testimony regarding cellular telephone previously to both federal and state regulators. I submitted affidavits to the FCC with respect to competition in the cellular industry in 1988 and 1989. I have participated in investigations and regulatory hearings in California that involved paging and cellular telephone in 1985-86 (both), 1988 (paging), 1989 (cellular), and 1991 (cellular). I have also testified before other state regulatory commissions regarding the proper scope of regulation of cellular telephone service. In 1989 I submitted testimony to the U.K. government (Department of Trade and Industry) regarding likely future developments of proposed Personal Communications Networks (PCNs or PCS). Beginning in 1989 and up to the present, I have continued to analyze the possible future evolution of PCS and their likely competitive effect on cellular, local exchange, interexchange, and other telecommunications services. In November 1992 I submitted an affidavit to the FCC regarding certain issues raised in the NPRM of July 16, 1992.

5. I have been asked by Pacific Telesis Group to analyze the ex parte submission of Telmarc Telecommunications, Inc. (Telmarc), entitled "Wireless Access to the Local Loop" which was prepared by Terrence P. McGarty, submitted February 17, 1993. In doing so I have also reviewed the paper of David P. Reed, "Putting It All Together: The Cost Structure of Personal Communications Services" (OPP Working Paper No. 28, November 1992).

I. SUMMARY AND CONCLUSIONS

6. Telmarc's paper attempts to demonstrate that economies of scope do not exist between the local network and the provision of PCS. The paper analyzes the question of economies of scope incorrectly because it does not use the correct economic concept of comparing the (long run) incremental costs of providing PCS using an existing landline network as compared to a stand alone PCS service. The paper by David P. Reed, "Putting It All Together: The Cost Structure of Personal Communications Services" (OPP Working Paper No. 28, November 1992) uses the correct economic approach in its analysis of landline network generated economies of scope in the provision of PCS. The Telmarc paper fails to do the correct economic analysis.

7. The paper's policy implications are not based on the correct economic concepts for economies of scope or economic efficiency. Instead, it bases them on notions such as "fair" prices and concludes that all carriers should charge each other the same access prices. This proposal will lead to economic inefficiency because prices will not be based on costs. Prices based on costs are the correct approach to ensure economic efficiency as has long been realized by economists and regulators. Since economies of scope exist, prices based on the lower costs which arise if the landline network is used in part to provide PCS will lead to lower PCS prices for consumers. Thus, economic efficiency will be higher.

II. ECONOMIES OF SCOPE IN THE PROVISION OF PCS

8. The Telmarc paper disagrees with the conclusion of the report by David P. Reed, "Putting It All Together: The Cost Structure of Personal Communications Services" (OPP Working Paper No. 28, November 1992). In particular, it questions the conclusion of the OPP Paper that economies of scope are significant between the public network (and cable systems) and provision of PCS. While I do not agree with all of Mr. Reed's analysis, I do

agree that economies of scope are likely to be significant in provision of PCS. I indicate below where the Telmarc paper errs in its understanding of economies of scope.

9. The Telmarc paper considers the cost of a new service to be its "depreciation plus expenses". (p. 9) This cost basis is incorrect to do an economic analysis. First, you must consider the overall cost of capital in an economic analysis, of which depreciation is only one part.¹ Next, the Telmarc paper talks about "bundling together" different resources in considering economies of scope. The correct economic analysis of economies of scope takes the existence of the public network as a given (since it exists) and attempts to answer the question of whether PCS can be provided at a lower incremental cost given the existence of the public network than if the PCS does not use the public network. If so, economies of scope exist for PCS in relation to the use of the public network.²

10. The Telmarc paper's primary argument in relation to the public switched network (PSTN) is that the technological base is "antiquated" (p. 10) and that use of the LEC PSTN would "raise barriers to entry to new competitors" (p. 10) because they cannot "cost effectively provide any service element in the best public interest."³ (p. 10) However, the paper's analysis of economies of scope is incorrect for at least two reasons: it neglects to consider the opportunity cost of capital (i.e. the net present value of the investment) and it fails to consider the incremental cost of PCS provision

¹ The opportunity cost of the capital used is the other major part of the cost of capital.

² This approach is followed by Mr. Reed in his analysis.

³ I am not trying to quote the paper out of context here but instead trying to convey the argument as best as I can understand it.

which is the correct cost basis to do the analysis.⁴

11. An example of how the Telmarc paper draws the incorrect conclusion is its analysis of interconnection on p. 12 of its Comments. The paper compares the depreciation of the LEC loop with that of cellular or digital microwave for a provisional CDMA PCS and concludes that the depreciation of the PCS would be less than the LEC (or interconnect from CATV). This argument is completely incorrect since the opportunity cost of the LEC plant is near zero because it is clearly a sunk cost given that the investment has already occurred and the value in another use is near zero. No matter how much the existing subscriber loops or feeder plant are used, their economic depreciation will not be affected. Thus, the incremental cost of interconnect for PCS on the LEC network is very low. To the contrary, for a stand alone PCS, new investment in the digital microwave plant for interconnect will require a significant opportunity cost for the new capital which will lead to a significant higher incremental cost for the stand alone PCS. Thus, Mr. McGarty's analysis is wrong. He attempts to base his analysis on accounting depreciation measures which have nothing to do with economic costs. Accounting depreciation measures are arbitrary, as is well known, and do not provide the correct basis for economic analysis.

12. The Telmarc paper also argues that if "the LECs are required to sell switched access at equitable marginally based rates" (p. 11) that economies of scope do not exist. (p. 11) It then claims that a "dramatic paradigm shift from past network Architectures" (p. 11) will occur because PCS

⁴ It is well known that the use of accounting depreciation which the Telmarc paper uses on p. 11 to consider economies of scope in the capital plant is incorrect. For instance as R.A. Brealey and S.C. Myers state in their introductory textbook in corporate finance: "Accountants rarely even attempt to measure present value. Instead they give a net book value (BV) which is original cost less depreciation computed according to some arbitrary schedule." (Principles of Corporate Finance, 4th ed., 1991, McGraw Hill, p. 271) No dispute exists that the correct method to determine the correct cost of a project is to compute its present discounted cost. The paper attempts to use accounting depreciation which leads to an incorrect analysis.

can provide its own switching or obtain it from a non-LEC source. Neither of these claims have anything to do with economies of scope. Indeed, regulators could force LECs to provide switching at a zero price (although I hope not) or AT&T may be able to provide switching to PCS from its Class 4 switches. To the contrary, what economies of scope imply is that to the extent that a LEC switch is currently providing switching for landline service, the switching for PCS can be added at an incremental cost less than a stand alone PCS switch would cost.⁵ The Telmarc paper provides absolutely no analysis to demonstrate that this proposition is not true.

13. The Telmarc paper makes the same mistake in its analysis of the "expense elements of access" (p. 13). It agrees that a LEC with existing switch capacity can provide it to a PCS at "less expense" jointly than a PCS could do it separately. Thus, economies of scope exist. It then claims that if the LECs are required to provide it at "equitable rates" the stand alone PCS expenses will not be greater. Its accounting is correct, but not its economic analysis. The economies of scope exist which determines cost; the price of LEC provided access is determined by regulators and could be in theory set to zero. However, it is the (incremental) cost which determines the existence of economies of scope, not the price set by regulation.

14. Mr. Reed (pp. 29-32) in the OPP Paper analyzed this question and concluded that economies of scope in switching do exist. In particular, Mr. Reed's calculation considers the incremental investment costs (which include the opportunity cost of capital) to provide PCS over telephone networks as well as the variable costs in providing PCS.⁶ He also correctly analyzes the

⁵ By incremental cost here I mean long run incremental cost (LRIC) which is based on the discounted present value of the cost of providing the service in the future.

⁶ Indeed, as Mr. Reed points out (p. 30), his estimates of economies of scope are underestimates of the actual economies because he does not fully analyze efficiencies from network integration of transmission or switching equipment.